

CLAIMS

What is claimed is:

1. An active matrix type liquid crystal display comprising:

    a switching element formed for each of a plurality of pixels decided by a plurality of bus lines;

    a short ring connected to the plurality of bus lines; and

    an electrostatic protection element portion formed between each of the plurality of bus lines and the short ring;

    wherein the electrostatic protection element portion comprises a thin film transistor having a source or a drain electrode connected to the bus lines and the drain or the source electrode connected to the short ring, a conductive material connected to a gate electrode of the thin film transistor, a first resistor connected to the conductive material for connecting the gate electrode of the thin film transistor to the bus lines, and a second resistor connected to the conductive material for connecting the gate electrode of the thin film transistor to the short ring.

2. An active matrix type liquid crystal display as set forth in claim 1 wherein the gate electrode of the thin film transistor is connected to the conductive material via capacitor.

3. An active matrix type liquid crystal display as set forth in claim 1 wherein the second resistor is a common resistor connecting the gate electrodes of the plurality of

thin film transistor to the short ring.

4. An active matrix type liquid crystal display comprising:

a switching element formed for each of a plurality of pixels decided by a plurality of bus lines; and

an electrostatic protection element portion formed between the adjacent bus lines;

wherein the electrostatic protection element portion comprises a thin film transistor having a source or a drain electrode connected to one of the adjacent bus lines and the drain or the source electrode connected to the other of the bus lines, a conductive material connected to a gate electrode of the thin film transistor, a first resistor connected to the conductive material for connecting the gate electrode of the thin film transistor to one of the bus lines, a second resistor connected to the conductive material for connecting the gate electrode of the thin film transistor to the other of the bus lines.

5. An active matrix type liquid crystal display as set forth in claim 4 wherein the gate electrode of the thin film transistor is connected to the conductive material via capacitor.

6. An active matrix type liquid crystal display comprising:

a switching element formed for each of a plurality of pixels decided by a plurality of bus lines;

a short ring connected to the plurality of bus lines; and

an electrostatic protection element portion formed

between each of the plurality of bus lines and the short ring; wherein the electrostatic protection element portion comprises a first thin film transistor having a source or a drain electrode connected to the bus line and the drain or the source electrode connected to the short ring, a conductive material connected to a gate electrode of the first thin film transistor, a second thin film transistor having a source or a drain electrode connected to the bus line, the drain or the source electrode connected to the conductive material, and a gate electrode electrically floated, and a third thin film transistor having a source or a drain electrode connected to the short ring, the drain or the source electrode connected to the conductive material, and a gate electrode electrically floated.

7. An active matrix type liquid crystal display as set forth in claim 6 wherein the gate electrode of the first transistor is connected to the conductive material via capacitor.

8. An active matrix type liquid crystal display as set forth in claim 6 wherein a channel length of at least one of the second and the third thin film transistors is shorter than a channel length of the first thin film transistor.

9. An active matrix type liquid crystal display as set forth in claim 6 wherein the third thin film transistor is a common transistor connecting the gate electrodes of the plurality of the first thin film transistors to the short ring.

10. An active matrix type liquid crystal display

comprising:

a switching element formed for each of a plurality of pixels decided by a plurality of bus lines; and

an electrostatic protection element portion formed between the adjacent bus lines;

wherein the electrostatic protection element portion comprises a first thin film transistor having a source or a drain electrode connected to one of the adjacent bus lines and the drain or the source electrode connected to the other of the bus lines, a conductive material connected to a gate electrode of the first thin film transistor, a second thin film transistor having a source or a drain electrode connected to one of the bus lines, the drain or the source electrode connected to the conductive material, and a gate electrode electrically floated, and a third thin film transistor having a source or a drain electrode connected to the other of the bus lines, the drain or the source electrode connected to the conductive material, and a gate electrode electrically floated.

11. An active matrix type liquid crystal display as set forth in claim 10 wherein the gate electrode of the first transistor is connected to the conductive material via capacitor.

12. An active matrix type liquid crystal display as set forth in claim 10 wherein a channel length of at least one of the second and the third thin film transistors is shorter than a channel length of the first thin film transistor.

13. An active matrix type liquid crystal display comprising:

a switching element formed for each of a plurality of pixels decided by a plurality of bus lines;

a short ring connected to the plurality of bus lines; and

an electrostatic protection element portion formed between each of the plurality of bus lines and the short ring;

wherein the electrostatic protection element portion comprises a plurality of metal layers, an insulating layer formed on the plurality of metal layers, a contact hole formed by opening the insulating layer on the plurality of metal layers, and a connecting layer electrically connecting between the metal layers via the contact hole.

14. An active matrix type liquid crystal display comprising:

a switching element formed for each of a plurality of pixels decided by a plurality of bus lines; and

an electrostatic protection element portion formed between the adjacent bus lines;

wherein the electrostatic protection element portion comprises a plurality of metal layers, an insulating layer formed on the plurality of metal layers, a contact hole formed by opening the insulating layer on the plurality of metal layers, and a connecting layer electrically connecting between the metal layers via the contact hole.

15. An active matrix type liquid crystal display comprising:

a switching element formed for each of a plurality of pixels decided by a plurality of data bus lines and gate bus lines;

a first common wiring connected to the data bus lines;

a second common wiring connected to the gate bus lines;  
and

an electrostatic protection element portion formed  
between the first common wiring and the second common wiring.

16. An active matrix type liquid crystal display as set  
forth in claim 15 wherein the electrostatic protection  
element portion comprises a plurality of metal layers, an  
insulating layer formed on the plurality of metal layers,  
a contact hole formed by opening the insulating layer on the  
plurality of metal layers, and a connecting layer  
electrically connecting between the metal layers via the  
contact hole.